Using blogs to support learning during internship

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Abstract

Blogging has been recommended as a suitable tool for learning during internship due to its associated usefulness in collaborative learning, reflection, communication, and social support. In this study, blogging was incorporated into the internship activities of two discipline-specific groups of interns: information management (\textit{n} = 53) and nursing (\textit{n} = 28). In examining the behavior, perceptions and processes of blogging among interns from the two disciplines, a mixed-methods design was used to obtain quantitative and qualitative data through structured interviews and blogging entries. Results revealed that the interns engaged regularly in the writing and reading of their own blogs, and commented on others' blog-writing. The interns perceived blogs to be useful during internship in providing an avenue for knowledge construction, problem solving, reflection, and communicating their emotions. Positive perceptions were not influenced by discipline background, frequency of use, or blogging platform. Qualitative analyses of blog contents indicated that the students engaged in cognitive, metacognitive-reflective, affective, and social-collaborative learning processes in blogging. Higher engagement was found in cognitive and metacognitive processes. Responses to open-ended probes suggest that pedagogical factors (e.g., grading system, supervision) may also have influenced students' blogging behaviors and perceptions. Overall, this study offers evidence to support the use of blogging during internship as computer-based support for learning.

Highlights

- Information management and nursing students used blogging during their internship.
- Interns engaged in regular activities of writing, commenting, and reading blogs.
- Blogging was found to be useful in facilitating information and knowledge sharing.
- Blogs show cognitive, reflective, affective, and collaborative learning processes.

Keywords: Collaborative learning; Blogs; Teaching/learning strategies; Professional learning

1 Introduction

The growing interest in using blogs for educational purposes has been accompanied by a number of studies that have demonstrated their effectiveness in higher and basic education (Buffington, 2007; Churchill, 2009; Downes, 2004; Gleaves, Walker, & Grey, 2008). At the same time, challenges associated with the use of blogging as a pedagogical strategy have also been identified (Krause, 2004). Researchers have suggested that blogging may support collaborative learning (Du & Wagner, 2007), and that its applications appear to have potential beyond classroom education (England, Fatzinger-McShane, Scarpero, & Stapley, 2008).

The term “blog” is an abbreviated form of “web log”, which is a web-based journal presented in reverse chronological order that consists of a person's thoughts and ideas posted on the web for

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multiple viewers (Flatley, 2005). It is a database containing text entries and other forms of content, including pictures and sound files, which can be created, edited and published on the Web in a flexible manner.

Blogging has recently been recommended as a useful tool for professional education or internship since blogs are simple and accessible personal diaries that allow a community of users to interact and communicate with each other (Levy, 2009). The main purpose of an internship is to facilitate the application of theoretical concepts learned in classroom settings to professional practice. In a way, internship shifts an individual mind to a social setting (Gonczi, 2004). While blogging appears to have the potential to support the development of cognitive processes and the social aspects of internship, empirical evidence supporting its use and how it may influence learning during students' professional education is still scarce. In view of the increased emphasis on collaborative learning and recent research showing the effectiveness of blogs in knowledge construction, this study explored blogging as an online learning environment for interns in two different disciplinary areas. The study specifically examined students' participation in and perceptions of blogging during internship, and their processes of learning while engaged in blogging.

We examined the blogging behaviors of undergraduate students in the University of Hong Kong who had been placed in different local and overseas organizations during their internships. The interns came from two distinct professional fields: information management and nursing. This allowed the study to examine students' experience of blogging and whether blogging could be effective as a supportive tool during the internship of students from different backgrounds. Students' perceptions of and attitudes toward blogging were also examined through structured interviews. How blogging might support student learning in internship was assessed by an analysis of the blog contents.

1.1 Collaborative learning

The changing paradigm of learning has shifted from individual towards collaborative learning (Hmelo-Silver, O'Donnell, Chan, & Chinn, in press; Sawyer, 2006), which is a form of constructivist learning. Constructivist learning approaches highlight the importance of learners taking active roles in processing and interpreting new information as they co-construct new knowledge (Dillenbourg, 1999; Duffy & Cunningham, 1996). Designing for constructivist learning requires providing students with opportunities for active processing of information and interaction with others (Hmelo-Silver, Duncan, & Chinn, 2007).

Collaborative learning has been promoted as a means of facilitating knowledge construction (Dillenbourg & Schneider, 1995), and the key features of collaborative learning are articulation, conflict and negotiation (Crook, 1996). Social constructivist principles support the use of collaborative interactions among students to promote deep learning through exposure to alternative perspectives (Brett & Nagra, 2005). In collaborative learning, two or more people learn together through communication, negotiation, and production of materials (Gros, 2001). Collaborative learning emphasizes both social and intellectual engagement, as well as focusing on mutual responsibility (Smith & MacGregor, 1992). The ensuing peer interactions, which represent an important component of the education experience, tend to increase (Pascarella & Terenzini, 2005). Earlier studies have shown that collaborative learning is effective in fostering shared understanding, retention of learned material, and deeper cognitive processing (Crook, 1996; Dillenbourg & Schneider, 1995). It has also been shown that collaborative learning promotes higher-order learning such as critical thinking and knowledge construction (Anderson, Howe, Soden, Halliday, & Low, 2001; Chan & van Aalst, 2008; Gokhale, 1995; Meyer, 2003; Webb, 1989).

Vygotsky (1986) maintained that social interaction plays a fundamental role in the development of cognition. In further research on cognition, Green (2005) suggested the term "spaces of influence", whereby an individual learner can learn more effectively through the support of others in dynamic collaborative problem solving roles. Collaborative learning places great emphasis on the extent and quality of the exchanges that occur among students in a given environment (Dillenbourg & Schneider, 2000).
1995). As such, the discussion that occurs during task engagement is an important component of collaboration (Pressley & McCormick, 2006). A major research field, computer-supported collaborative learning (CSCL), has emerged showing that learning in groups can be enhanced by students constructing and synthesizing complex interactions of ideas during collaboration (Stahl, 2002). Evidence indicates that collaborative learning is successful in online learning environments (Chan & van Aalst, 2008; Chu & Kennedy, 2011; Curtis & Lawson, 2001; Wang, 2010; Woo, Chu, Ho, & Li, 2011) and allows students to broaden their knowledge base through interactions with other learners (Chu, 2008; Tyran & Shepherd, 2001).

One approach to examining collaborative knowledge construction in a CSCL environment has been proposed by Hmelo-Silver (2003) using qualitative and quantitative analyses from a socio-cognitive perspective. To capture the thinking and discourse processes of students engaged in an online platform, transcribed online conversations were coded into the following categories: knowledge, metacognition, interpretation, and collaboration. Collaboration was further categorized as conflict, questioning, and facilitator input. In a similar approach, van Aalst (2009) employed qualitative and quantitative analyses to examine the collaborative knowledge construction processes of secondary school students using an online platform for an inquiry project involving knowledge building (van Aalst, 2009). These aspects of learning are thus considered in this current research in deriving the schemes of analyses.

1.2 Online learning environment: the educational benefits of blogs

Blogging has been increasingly recognized as a popular web technology for education (Blood, 2002; Downes, 2004), especially in distance learning settings (Buffington, 2007; Churchill, 2009; Downes, 2004). Blogs are designed to allow simple and fast creation of web content, frequent interactions with posts and comments, and instant hyperlinks to information sources (Du & Wagner, 2007). Blogging has initially attracted interest from professionals whose tasks involve information retrieval and search (Williams & Jacobs, 2004). Clearly, blogging is particularly appealing in disciplines that put a high value on information acquisition, knowledge construction, and reinforcement of learning through feedback and comments (Betts & Glosgoff, 2004; Chu, Kwan & Warning, in press). Furthermore, interest in blogging as an educational resource has also been fueled by the capacity of blogging as a means to promote individual self-expression and social connectivity (Burgess, 2006). Various researchers have discussed the use of blogs in education and have suggested the potential benefits of blogging among learners (Boulos, Mambaram, & Wheeler, 2006; Clyde, 2004; Duffy & Bruns, 2006; Grassley & Bartoletti, 2009).

One particular benefit associated with blogging relates to its potential to facilitate collaborative and constructivist learning in terms of social interdependence through knowledge sharing, feedback sharing, and social support (Johnson & Johnson, 1994). For instance, an analysis of blogs in an undergraduate course demonstrated their effectiveness in supporting constructivist learning models in higher education (Du & Wagner, 2006). The study reported that blogs supported the social and cognitive construction of knowledge by facilitating university students’ involvement in knowledge construction and heightened awareness of the learning process. Social construction of knowledge refers to the expansion of information resources among blog users, and cognitive construction of knowledge to users’ construction of mental models. The usefulness of blogging for constructivist learning was also supported by Ellison and Wu (2008), who suggested that blogging encouraged critical and analytical thinking as it allowed students to develop wider perspectives by interacting with their peers.

Closely related to knowledge construction, blogs have also been found to be a useful learning environment by providing a useful platform for reflection (Churchill, 2009; Stiler & Philleo, 2003). It has been suggested that blogs may serve as online journals (Richardson, 2005), encouraging learners to reflect on their experiences (Godwin-Jones, 2003). In this respect, reflection among students has been found to be enhanced by blog entries that were analytical in nature (Stiler & Philleo, 2003). This may be explained by the discussion and exploration that occurs with blogging, leading to reflection in
the form of guided discovery (Glogoff, 2005). Furthermore, access to different perspectives through the comments of the other members of the community encourages better individual reflection (Lin, Hmelo, Kinzer, & Secules, 1999). The distinct characteristic blend of personal narrative and critical reflection in blogs has also been identified as potentially effective in supporting cognitive learning (Deng & Yuen, 2011). In addition, the opportunity to make comments in blogs facilitates social interaction, which when combined with reflections, enhances the collaborative dimensions of academic competence (Chong, 2010).

Studies have also examined students’ experience of using blogs, and it appears that reading other blogs and receiving feedback on one’s own blog were the more effective aspects of learning through blogs (Churchill, 2009; Ellison & Wu, 2008). Apparently, the functional features of blogs enable learners to exchange information with other online learners, while also retrieving and managing information efficiently (Du & Wagner, 2007). Blogs, being open systems, also offer access to other applications in the external environment such as software that is video-based [e.g., YouTube], picture-based [e.g., Flickr], and bookmark-based [e.g., Del.icio.us] (Kim, 2008), effectively providing greater access to multi-modal information.

As an online learning environment, the use of blogs has increased substantially in the area of second language learning (Godwin-Jones, 2003). Blogging has been found to provide a platform for second language learners to develop personalized content as they learned how to use their language learning strategies effectively (Murray & Hourigan, 2008). Another area of blog application that has developed is distance education. For instance, one study used blogs among master level students who were enrolled in a distance learning course (Kerawalla, Minocha, Kirkup, & Conole, 2009). The study showed that students’ blogging behaviors were varied, and that they were influenced by factors that were related to their perceptions and needs for an audience and a community. Technological aspects and pedagogical context were also found to be relevant factors that influenced the use of blogging in distance education. The usefulness of blogs for distance education has been attributed to its potential to encourage interaction among students and teachers (Yang, 2009). Serving as a good alternative to face-to-face interactions, which goes beyond the time and place constraints of the classroom (Buffington, 2007; Ellison & Wu, 2008; Glogoff, 2005), blogs alleviate social concerns associated with feelings of isolation among the students (Dickey, 2004).

Despite the reported positive affordances of blogging in education, it has also been found that the implementation of blogging is not always successful. For instance, Krause (2004) reported that university students’ use of blogs in a writing class showed entries that appeared to be haphazard, involved minimal communication between students, and reflected poor reflection. It has also been reported that students engage in blogging only to meet certain assessment requirements (Homik & Melis, 2006). The challenge of implementing blogging as a learning tool is heightened when students have minimal prior blogging experience (Kerawalla, Pearce, Yuill, Luckin, & Harris, 2008). It has further been argued that the way students understand and use blogging is linked with the tasks and outcomes that are associated with their professional field (Kerawalla et al., 2009).

1.3 Professional learning

Serving as a bridge between university education and paid employment (Clarke, 2004), professional learning, or internship, represents an important stage in higher education, which prepares students for professional practice (McManus & Feinstein, 2008). It has also been described as a strategy for an individual to make sense out of real experiences and integrate them for future use (Clarke, 2004). Hands-on experience, informal apprenticeships with active professionals, and exploration of learning through other institutions (e.g., business, community associations) have been considered as fundamental ways of refining students’ knowledge and skills, and helping them to attain new insights into their professions (Weinberg, 1986).

Reflection, where learners examine their responses, beliefs, and premises in the light of their experiences in order to gain new understanding (Rogers, 2001), has been identified as an integral
component of professional learning (Dietz, 1998). Through reflection, learners make informed decisions based on their past practices and responses to issues (Clarke, 2004). It has been suggested that written records, such as reflective journals, facilitate better recall and reflection than face-to-face discussions (Wells, 1999). It has been seen that students develop professionally by using reflective journals, where they are able to link theories with practice and evaluate work performance (Sinclair & Woodward, 1997). As previously mentioned, blogs have been promoted as online forms of reflective journals (Godwin-Jones, 2003; Richardson, 2005).

During internship, students have been shown to develop a need to feel a sense of belonging to a social entity (Ryan & Deci, 2000). Interns appear to gain greater motivation to work when they perceive their placements to be responsive to this need for a sense of belonging (Ladyshewsky & Gardner, 2008). This aspect of professional learning may potentially be addressed by blogging due to its accessibility features that have been demonstrated to be supportive of interaction among users (Yang, 2009). Blogs have actually been shown to be good motivational tools as they encourage students to engage in interactive discussions (Downes, 2004; Flatley, 2005).

Student interns have also been found to place a high value on emotional support, collaboration, and feedback from their teachers during internship (Murray-Harvey, 2001). However, in many cases, time constraints among teachers and geographical dispersion among students limit support on a face-to-face basis. Previous studies have addressed this limitation by using web-based asynchronous discussions (Aaron-Doering & Dexter, 2003), email (Graf & Stebnicki, 2002), and video-conferencing to provide support during internship (Nasiopoulos & Ward, 2002).

While the characteristics of blogging appear to fit the needs and constraints associated with internship, only a small number of studies have examined the application of blogging in this learning context. One such study was carried out among dietetic interns, and it showed that blogging can be helpful in terms of providing a venue for reflection on experiences, acquisition of knowledge, and development of skills for particular work situations (England et al., 2008). The student interns also reported that blogging was relatively free of stress and was user-friendly even for those without website maintenance knowledge.

It appears that blogging may be a supportive tool during internship. However, limited empirical evidence has been established to support this proposition. While the impact of blogging in internship has been largely characterized in terms of students’ perceptions of its usefulness, the actual use of blogs based on students’ entries, has not been adequately examined. Evidence from blog contents of students who were engaged in coursework has shown that cognitive and social construction of knowledge occurs in the context of constructivism (Du & Wagner, 2007). Whether this occurs during internship as well has yet to be determined. Blogging has been recommended as a means to encourage reflection. However, a deeper understanding of how reflection occurs through blogs still needs to be pursued. This study aims to address these gaps in research and contribute to the evidence surrounding the potential use of blogs in education, with a focus on internship. Furthermore, the factors that might influence the use of blogs during internship are explored.

2 Research methodology

The key research question of this study was: How do students perceive and use blogs as a tool for learning during internship? A mixed-methods research design was used, and the following specific research questions (RQ) were posed:

- **RQ1**: What are the students’ patterns of participation in blogging?
- **RQ2**: What are the students’ perceptions and attitudes in relation to using blogs during internship?
- **RQ3**: What learning processes are the students involved in when they engage in blogging?
- **RQ4**: Are there differences between student cohorts in terms of blogging behavior, perceptions, processes and experiences, and what other factors might influence blogging?

2.1 Participants
Bloggers included second-year undergraduate students from the Bachelor of Information Management (BScIM) and Bachelor of Nursing (BScN) programs. While all students were using blogs during their internship, the research participants included only those who gave their informed consent after having been duly informed about the study methods and implications (BScIM n = 53; BScN n = 28). The BScIM students were made up of three cohorts based on their years of enrollment from 2006 to 2008. They were all taking part in an internship program lasting from one to three months in various organizations. The following is the breakdown of BScIM research participants in this study: 16 out of 19 interns in 2006, 16 out of 21 interns in 2007, and all the 21 interns in 2008. For each year, approximately 80% of the students were undertaking their internship in local organizations, while the remaining 20% were doing their internship in Mainland China or in overseas organizations. A faculty supervisor was assigned for each intern and given about 6 hours of supervision for each student. The BScN students, who were undergoing their clinical practicum from June 2007 to August 2008 (28 out of 48 interns), comprised one cohort of students. They were divided into six groups of eight students, in different clinical placements in Hong Kong, with 3 full-time clinical instructors.

2.2 Data collection

The three cohorts of BScIM interns were asked to create blogs to share their experiences during their internships. Each cohort of participants had a different blogging environment. The first cohort was using a commercial blogging system: either Xanga (http://hk.xanga.com) or Blogger (https://www.blogger.com). The commercial blogging systems mainly provided blogging services with communication tools and search functions as complements. The second cohort were using an open source content management system named Drupal, which is a software package that allows an individual or a community of users to publish, manage, and organize a wide variety of content on a website. Using Drupal, blogging systems were set up and managed internally by the faculty. Similar to the first cohort, the third cohort was also using a commercial blogging system, but this time, another system called YouBlog (http://www.youblog.cc). YouBlog provided similar functions of posting and searching information. The BScN cohort, depending on their year of entry into internship, was using either an internally-maintained Drupal (2007) or the commercial YouBlog (2008).

BScIM internship requirements included the submission of reflections. In this study, the students were asked to write their reflections as blogs starting from the first week of their internship until the end of it, with a recommended frequency of every one to two days. The content of the blogs accounted for 30% of their final grade in the internship. Students were advised to share what they had learned and the useful resources that they found during the course of their internship. The blogs were accessible to classmates and their faculty supervisors.

The BScN students were encouraged by their clinical instructors to use the nursing blog in the period of clinical practicum to support clinical teaching and learning; however, the blog contents had no bearing on their clinical grades. On a regular basis, the clinical instructors reviewed, monitored and responded to the blogs, comments posted, and other related blogging activities (e.g., photos, information chart, and webpage URL upload).

2.2.1 Data sources
2.2.1.1 Blogging behaviors

In this study, blogging behaviors referred to the frequency with which students wrote their own blogs, commented on others’ blogs, and read their own and others’ blogs. Frequencies of both reading and writing behaviors were reported by participants in response to structured telephone interview questions. Students were asked how often they engaged in blogging and to choose a response from a scale of 1–5, where 1 referred to “once a month or less” and 5 referred to “once a day or more”. To verify self-reported frequencies of writing behaviors (own blogs and comments) per week, blogs were counted based on the time stamp on each blog. The total number of blogs was also measured.
2.2.1.2 Perceptions of blogging

A short telephone interview was conducted with each participant, which included both structured and open-ended questions to examine students' perceptions of the effectiveness of blogging as a platform for learning and collaboration. The structured interview questions concerned the usefulness of blogs for learning, information sharing, and knowledge sharing. Students were asked to indicate the extent to which they agreed or disagreed with the statements according to a 4-point Likert-type scale. A score of 1 was equivalent to "Strongly disagree", 2 to "Disagree", 3 to "Agree", and 4 to "Strongly agree". The second part of the interview consisted of open-ended probes, which were used to explore what students thought about the use of blogging during their internship. All the responses to the open-ended questions were audio-recorded and transcribed for data processing.

2.2.1.3 Learning experiences and processes using blogs

As described above, students from both BScIM and BScN engaged in blogging over the duration of their internship. Upon completion of internship by all participant cohorts, blog entries and comments were copied from the blogging systems. Each blog entry and comment contained the username of the writer, and a date and time stamp. All the blog entries and comments were then uploaded as text files into NVivo 8.0 software, which was used to facilitate qualitative data analysis.

2.3 Data analysis

2.3.1 Blogging behavior and frequency

Students' reports of their blogging frequency were analyzed using the interquartile range (IQR), and students with scores below the 25th percentile were classified as infrequent users, while those with scores above the 75th percentile were classified as frequent users. The IQR is a measure that depicts the limits within which the middle 50% of a dataset falls (Field, 2005) and shows the outer bands of the data. Currently, there are no established measures that classify the norms for frequency of blogging. As such, we deemed the IQR to be a relevant basis for classifying frequency as it effectively identified students with the upper and lower levels of participation based on the raw blogging frequency data.

2.3.2 Perceptions of blogging

Responses on the Likert-type scales were summarized using descriptive statistics, and mean scores that were higher than 2.5 were interpreted as edging toward the positive, while mean scores that were lower than 2.5 were interpreted as edging toward negative feedback. Ratings on the effectiveness of blogs were tested using the one-sample Kolmogorov–Smirnov test for normality. Since the results showed that the normality of data was questionable (p < 0.05 in Kolmogorov–Smirnov test), the Mann–Whitney test was used to compare the responses according to discipline background and frequency groups. Statistical significance level was set at p < 0.05.

2.3.3 Learning experience and processes of blogging

Data from the students' blogs were analyzed qualitatively, and a unit of analysis was an individual blog entry by a student, with a specific date and time stamp. Each comment posted by a student was also considered one unit of analysis. Based on earlier studies by Hmelo-Silver (2003) and van Aalst (2009), the preliminary coding framework included the following themes: cognitive, metacognitive and collaborative. Additionally, an affective theme was included in view of the suggested utilities of blogging as online learning platforms (Du & Wagner, 2007; Ladyshewsky & Gardner, 2008). Following the research tradition in analyzing students' online data (Hmelo-Silver, 2003), we expected that when using blogs, students would have different experiences and engage in different learning processes, which could be revealed through qualitative analyses of their blog entries. Supervisors' comments were also counted, but were not analyzed since the focus was on learning.
processes that were reflected in students' blogs.

Qualitative analysis of blogging entries was conceptually guided, and used interactive top-down and bottom-up processes employed in cognitive studies (Chi, 1997; Lee, Chan, & van Aalst, 2006). Socio-cognitive processes of online learning (van Aalst, 2009; Hmelo-Silver, 2003) informed the analyses of learning and collaborative processes of blogging. Preliminary coding was done by the first author and two research assistants using a subsample of selected blog entries from a group of students drawn from both BScIM and BScN. The preliminary analyses then led to iterative processes of analyses to refine the scheme, leading to the subthemes, with various iterations discussed by the research team. To establish inter-rater reliability, two research assistants independently coded 50 randomly selected blogs based on the scheme, which resulted in 90% inter-rater agreement. The themes and subthemes that emerged from the data are summarized and illustrated in Table 1.

Four major themes were identified: cognitive, metacognitive, social and affective. Cognitive knowledge construction blogs were defined as those that focused on cognitive processes of information sharing and knowledge acquisition, building on users' mental models (Du & Wagner, 2007). Further analysis in this study revealed three cognitive subthemes: information sharing, knowledge construction, and problem solving. Information sharing blogs included those that directed peers toward sources of information such as books or online sources (e.g., links to websites). Knowledge construction blogs were those in which students discussed and co-constructed their understanding of a relevant topic or knowledge area within their discipline. Problem-solving blogs contained students' accounts of solutions to problems encountered in their professional practice.

Table 1 Evident learning processes in interns' blog contents.

<table>
<thead>
<tr>
<th>Overarching theme</th>
<th>Subthemes</th>
<th>Sample references</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>Information sharing</td>
<td>The Free Software Directory was a project of the Free Software Foundation (FSF) and UNESCO. They cataloged useful free software that runs under free operating systems—particularly the GNU operating system and its GNU/Linux variants.</td>
</tr>
<tr>
<td></td>
<td>Knowledge construction</td>
<td>The reading comprises different sections that aim at showing the way that an implementation plan can be done. Time line is shown for tasks segmentation. Each stage has own objectives and key tasks. That can be regarded as guideline for ensuring work on schedule and governing for close monitoring.</td>
</tr>
<tr>
<td></td>
<td>Problem solving</td>
<td>Although the search functions in MS ACCESS were not user-friendly, a user could still search the specific panel. We designed a large range of keyword table that easily hit the data entry. Therefore, we successfully enlarged the search results.</td>
</tr>
<tr>
<td>Metacognitive-reflective</td>
<td>Knowledge</td>
<td>I only realized it after Janet came – that he had signs of infection and Hibitine shouldn’t be used! And while I was doing my work, I mixed up the contaminated forceps with sterilized substances! I really had learnt about these before, but why did I forget about them in the real setting?</td>
</tr>
<tr>
<td></td>
<td>Experiences</td>
<td>What a shame that I did not prepare well before the journey. If I had already known all the aspects of the nature of the work, it would be much easier and interesting to carry out tasks.</td>
</tr>
<tr>
<td>Collaborative/social</td>
<td>Posing questions</td>
<td>If the patient complains about pain in his surgical site (e.g. assume his pain scores 8/10), then should I give him Tramadol or Dolgesic?</td>
</tr>
<tr>
<td></td>
<td>Providing feedback</td>
<td>I know you are able to write PHP language. Try that, it's better to create a High Level view to user instead of asking them to operate a low level language.</td>
</tr>
<tr>
<td>Affective</td>
<td>Positive emotions</td>
<td>During commode bath, the old man suddenly spoke to me in English, “I give you full marks.” This is the first time I was praised by my patient. And it was in English! I was very pleased.</td>
</tr>
<tr>
<td></td>
<td>Negative emotions</td>
<td>Again, I felt very dizzy and scared for my respiratory system due to working in such smoking environment. I needed to get out of the office to have deep breaths every 2 hours of work, or I would die!</td>
</tr>
</tbody>
</table>
Metacognition has been described as a process of reflection on task demands and task performance strategies (Beitz, 1996). Primarily, it refers to an understanding of what one knows and what one does not know, as well as the use of strategy to address gaps in understanding (Hmelo-Silver, 2003). Furthermore, metacognition involves reflections on experiences that prompt individuals to examine the context, meaning, and implications of their experiences from a broader perspective (Rosenbaum, Lobas, & Ferguson, 2005). In this study, blogs coded as metacognitive-reflective suggested that student reflections included both knowledge and experiences. Such blogs contained entries that indicated students’ reflection, regulation and discoveries related to their knowledge gaps. On the other hand, experience reflection blogs were those that indicated students’ personal insights into the meaning and implications of their internship experiences in the broader context of life.

Social engagement has been recognized as an important component of collaborative learning (Smith & MacGregor, 1992). Various categories also include collaborative elements, but this category identifies direct communication and interaction among students, and thus, most clearly illustrates collaboration. Social-collaborative blogs identified in this study further revealed two subthemes: posing questions to the rest of the group, and feedback responses that contributed to joint problem-solving. Schemes in earlier studies have also considered asking questions as a collaborative process (e.g., Hmelo-Silver, 2003).

Blogs were coded into the affective theme when the contents addressed users’ need to communicate emotions and support, which has been found to have a high value among interns (Murray-Harvey, 2001). Coding revealed that affective blogs were made up of positive emotions, negative emotions, and expressions of social support.

3 Results
3.1 Blogging behaviors and frequency

Participants reported their blogging activities in terms of blog-writing, reading their own and others’ blogs, and giving comments (see Table 2). An ordinal scale was used as a measure of frequency, and self-reported data showed that the interns were engaged in blogging activities at least once a week, indicating regular use of the online learning environment. Similarly, actual frequency based on the time stamps showed that the average weekly frequency of students writing their own blogs was 1.78 and 1.56 respectively for BScIM and BScN students. The average weekly frequency of commenting was 1.15 and 1.19 respectively for BScIM and BScN interns.

A total of 984 blogs entries were identified in the data captured by the blogging systems. The total (871) number of blogs by BScIM students (n = 53) was found to be higher than the total number (113) of blogs by BScN students (n = 28). The average number of blog entries for a BScIM student (M = 45.8, SD = 28.5) was found to be significantly higher (p < 0.01) than the average number of blog entries for a BScN student (M = 18.5, SD = 22.3). Of the total number of blogs, 38.8% were comments of BScIM students and 42.4% were comments of BScN students. A count of internship supervisors’ comments showed that BScN supervisors participated far more frequently in the blogging activities (79 comments) than the BScIM supervisors (4 comments).
Table 2 Median frequency of the students' reported blogging behaviors.

<table>
<thead>
<tr>
<th>Blogging behaviors</th>
<th>BScIM (n = 53)</th>
<th>BScN (n = 28)</th>
<th>Sig. Mann–Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Writing one's own blog</td>
<td>3.21 (0.79)</td>
<td>2.86 (1.21)</td>
<td>0.27</td>
</tr>
<tr>
<td>- Reading one's own blog</td>
<td>2.83 (1.05)</td>
<td>2.79 (1.19)</td>
<td>0.88</td>
</tr>
<tr>
<td>- Reading classmates' blogs</td>
<td>3.04 (0.96)</td>
<td>3.07 (1.18)</td>
<td>0.82</td>
</tr>
<tr>
<td>- Commenting on classmates' blogs</td>
<td>2.19 (0.94)</td>
<td>2.29 (0.85)</td>
<td>0.64</td>
</tr>
</tbody>
</table>

Notes: Participants answered according to a scale of 1-5: 1-'Once a month or less', 2-'Once every two weeks', 3-'1-2 times a week', 4-'3-6 times a week', and 5-'Once every day or more'.

3.2 Perceptions of blogging

Students generally perceived the blogs to be useful as a platform for learning, with ratings all above 2.5 (on a 4-point scale) for both cohorts. The top two items for BScIM students were information sharing and reading others’ blogs, and the top two items for BScN students were reading others' blogs and learning problem solving. Comparing the two groups, BScIM and BScN students generally gave similar ratings for the different areas as shown in Table 3. However, significantly higher ratings were given by BScN students for the usefulness of blogs in learning from others' problem-solving experiences ($p = 0.02$).

Table 3 Students’ overall rating on the usefulness of blogs as a platform for learning.

<table>
<thead>
<tr>
<th>Survey items</th>
<th>BScIM (n = 53)</th>
<th>BScN (n = 28)</th>
<th>Sig. Mann–Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Reading others' blogs during internship is useful</td>
<td>2.91 (0.66)</td>
<td>3.11 (0.42)</td>
<td>0.18</td>
</tr>
<tr>
<td>- Classmates shared problem-solving experience on blog</td>
<td>2.75 (0.67)</td>
<td>2.96 (0.51)</td>
<td>0.19</td>
</tr>
<tr>
<td>- Blogging is useful for learning from others' problem-solving experiences</td>
<td>2.58 (0.69)</td>
<td>2.96 (0.51)</td>
<td>0.02**</td>
</tr>
<tr>
<td>- Blogging is suitable for learning from others’ internship experience</td>
<td>2.94 (0.69)</td>
<td>2.88 (0.57)</td>
<td>0.35</td>
</tr>
<tr>
<td>- Blogging facilitated information sharing</td>
<td>3.09 (0.53)</td>
<td>2.93 (0.54)</td>
<td>0.19</td>
</tr>
<tr>
<td>- Blogging facilitated knowledge construction</td>
<td>2.86 (0.48)</td>
<td>2.89 (0.63)</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Notes: Ratings are based on a 4-point Likert-type scale: 1 - "Strongly disagree" and 4 - "Strongly agree".
*statistically significant at $p < 0.05$.

Open-ended probes were utilized in interviews to examine further the students' perceptions of the usefulness of blogs for learning. Responses were grouped into themes and are summarized in Table 4. The positive comment that was most often reported by both student groups also referred to learning from others' problem-solving experiences. While this perception was generally shared by the majority of BScN students (21 out of 28 respondents), it was less common among BScIM students (27 out of 53 respondents). Furthermore, the negative comment that was most cited by BScIM students was the exact opposite – that they did not learn from others' problem-solving experiences due to limited applicability (22 out of 53 respondents).
Table 4 Students’ comments on the usefulness of blogs for learning.

<table>
<thead>
<tr>
<th>Positive comments</th>
<th>BSIM students (n = 53)</th>
<th>BScN students (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learn from others’ problem-solving experiences (29)</td>
<td>Learn from others’ problem-solving experiences (21)</td>
<td></td>
</tr>
<tr>
<td>Learn more about different jobs (17)</td>
<td>Learn knowledge about the job (14)</td>
<td></td>
</tr>
<tr>
<td>Know what others are doing (14)</td>
<td>Find academic resources (14)</td>
<td></td>
</tr>
<tr>
<td>Share information, including text, photos and videos for a common project/goal (13)</td>
<td>Share information, including text, photos and videos for the common project (13)</td>
<td></td>
</tr>
<tr>
<td>Know what others are doing (10)</td>
<td>Learn knowledge about medicines (10)</td>
<td></td>
</tr>
<tr>
<td>Know more information about the company (8)</td>
<td>Gain more knowledge about medicines (7)</td>
<td></td>
</tr>
<tr>
<td>Know about others’ fields (7)</td>
<td>Learn from others’ experience (6)</td>
<td></td>
</tr>
<tr>
<td>Learn from others’ experience (7)</td>
<td>Learn from others’ experience (7)</td>
<td></td>
</tr>
<tr>
<td>Free access anywhere at any time (7)</td>
<td>Gain more knowledge about the field (3)</td>
<td></td>
</tr>
<tr>
<td>Gain more knowledge about the field (4)</td>
<td>Saves time (2)</td>
<td></td>
</tr>
<tr>
<td>Source for help in problem solving (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learn interpersonal skills (4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Negative comments</th>
<th>BSIM students (n = 53)</th>
<th>BScN students (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not learn from others’ problem-solving experience due to inapplicability (22)</td>
<td>Time consuming to blog (3)</td>
<td>Prefer other alternatives (3)</td>
</tr>
<tr>
<td>Blog content lacks quantity and depth (7)</td>
<td>Prefer other alternatives (3)</td>
<td>Too dependent on students’ initiative (2)</td>
</tr>
<tr>
<td>Unimportant and routine content (4)</td>
<td>Blog should be more about emotional sharing than pure information or knowledge sharing (2)</td>
<td></td>
</tr>
<tr>
<td>Did not read others’ blogs or read entries (3)</td>
<td>Prefer other ways, i.e. Facebook (2)</td>
<td>Seldom use blogs (1)</td>
</tr>
<tr>
<td>Most comments are personal rather than useful information (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blogs are not centralized (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Too formal, students write just to complete the assignment (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge from another field is not useful (2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Numbers in brackets refer to the number of students who gave the comments.

Some students also reported that the blogs had facilitated increased knowledge about their fields of practice, and that reading about their peers’ experiences allowed them to learn from others’ experiences. Most BSIM students, who were in diverse professional settings, reported that one of the positive aspects of blogging was that they had come to know what other students were doing through the blogs. On the negative side, a number of students from both groups gave comments that indicated a perceived lack of depth in the blog contents. However, a contrast was observed: whereas two BSIM students criticized the blog comments for being personal rather than useful information, two BScN students stated that sharing thoughts and feelings in the blogs should be emotional in nature rather than being limited to the sharing of information.

Importantly, as an overall measure of perceptions, the students’ degree of satisfaction with the blogging systems was examined. Students generally found their blogging systems to be satisfactory,
and they were positive about recommending the use of blogs for interns in succeeding years. It may be noted that the 3 cohorts of BScIM and the BScN interns used different blogging systems (i.e., commercial or internally-maintained) depending on their year of internship. Despite the different blogging systems, however, no significant differences were noted between the ratings of the student groups in terms of satisfaction with the blogging system ($p = 0.38$) and recommending blogging for subsequent interns ($p = 0.71$), as shown in Table 5.

**Table 5** Students' overall rating for satisfaction with blogging system.

<table>
<thead>
<tr>
<th>Survey items</th>
<th>BScIM (n = 53)</th>
<th>BScN (n = 28)</th>
<th>Sig. Mann–Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Satisfied with blogging system*</td>
<td>2.96 (0.55)</td>
<td>2.84 (0.55)</td>
<td>0.38</td>
</tr>
<tr>
<td>- Suggest adopting blogging for next year's interns</td>
<td>3.01 (0.53)</td>
<td>2.93 (0.66)</td>
<td>0.71</td>
</tr>
</tbody>
</table>

*statistically significant at $p < 0.05$.

**3.3 Learning through the blogs**

Blog entries were coded into the four overarching themes and the subthemes based on a coding scheme developed to tap into students' experiences during blogging. Table 6 shows the number of blogs from different categories across the two groups. The subthemes provide glimpses into what students were involved in when they engaged in blogging. A substantial number of coded blogs illustrate the cognitive knowledge construction theme (BScIM: 34.6%; BScN: 22.4%). The cognitive aspect of learning was apparent in blogs in which students appeared to share knowledge and sources of information, and engage in problem-solving. With respect to the problem-solving blogs, the sharing of problem-solving in the student community could be interpreted as a reflection of the application of knowledge in the real-world.

**Table 6** Distribution of coded blogs in the hierarchy of themes across the student groups.

<table>
<thead>
<tr>
<th>Cognitive knowledge construction</th>
<th>BScIM (n = 828)</th>
<th>BScN (n = 125)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Number of blogs</td>
<td>300</td>
<td>28</td>
</tr>
<tr>
<td>- Percentage</td>
<td>34.56</td>
<td>22.40</td>
</tr>
<tr>
<td>Information sharing</td>
<td>90</td>
<td>19</td>
</tr>
<tr>
<td>Knowledge construction</td>
<td>122</td>
<td>6</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>88</td>
<td>3</td>
</tr>
<tr>
<td>Metacognition/Reflection</td>
<td>278</td>
<td>52</td>
</tr>
<tr>
<td>Knowledge</td>
<td>169</td>
<td>19</td>
</tr>
<tr>
<td>Experiences</td>
<td>109</td>
<td>33</td>
</tr>
<tr>
<td>Collaboration</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>Posing questions</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Providing feedback</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Affective theme</td>
<td>263</td>
<td>39</td>
</tr>
<tr>
<td>Positive</td>
<td>128</td>
<td>13</td>
</tr>
<tr>
<td>Negative</td>
<td>83</td>
<td>22</td>
</tr>
<tr>
<td>Social support</td>
<td>52</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL*</td>
<td>868</td>
<td>125</td>
</tr>
<tr>
<td>Percentage</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

*The total number of coded blogs are not equivalent to the total blog entries (BScIM: 871; BScN: 113) because some blog entries were not coded into any theme, or were coded into more than one theme when appropriate.
For both groups of students, a large number of blogs contained metacognitive-reflective themes (BScIM: 32%; BScN: 41.6%). Blog contents show that students in both groups metacognitively reflected on the extent of their knowledge as well as on their personal experiences. Metacognitive processes relating to one’s own knowledge (e.g., I didn’t think of that; I could have thought about…) and work strategies (Chan & van Aalst, 2008) were observed in the blogs. The metacognitive subtheme shows that students analyzed their knowledge in relation to their future professional work. While the BScIM interns had more entries showing metacognitive knowledge, the BScN students had more entries indicating reflection on personal experience in relation to broader perspectives.

Social-collaborative references indicated that students used blogs to pose questions to their peers and receive feedback through online responses. While this overarching theme accounted for a relatively small proportion of the coded blogs (BScIM: 3.11%; BScN: 4.8%), the generated subthemes provide indicators that blogging may have provided the interns with the opportunity to pose questions and gain beneficial feedback from their peers as they collaborated to learn.

A large number of blogs with affective contents were also found (BScIM: 30.3%; BScN: 31.2%), indicating the potential role of blogging in managing the emotional aspects of learning. Through the blogging platform, students were able to give vent to negative emotions and shared positive feelings such as inspiration, success, satisfaction, and motivation. Students also used the function of commenting on other students’ blogs to express social support for their peers.

### 3.4 Frequency of blogging and students’ perceptions

Participants were also grouped in terms of blogging frequency, with frequent and infrequent users identified using the interquartile range. Scores showed that both frequent and infrequent users gave generally positive ratings for the usefulness of blogging (2.5 and above). Relatively speaking, high-frequency BScN users gave higher ratings, and low-frequency BScN users gave the lowest ratings. The descriptive statistics showed that frequent users in both groups of students had higher scores than infrequent users; however, statistical analyses indicated that the differences were not significant (see Tables 7 & 8).

<table>
<thead>
<tr>
<th>BScIM students survey questions</th>
<th>Frequent users (n = 13)</th>
<th>Infrequent users (n = 13)</th>
<th>Sig. Mann-Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Median</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Reading others’ blogs is useful</td>
<td>3.00 (0.41)</td>
<td>3.00</td>
<td>2.85 (0.69)</td>
</tr>
<tr>
<td>Blogging is suitable for learning from others’ internship experiences</td>
<td>3.23 (0.44)</td>
<td>3.00</td>
<td>3.08 (0.64)</td>
</tr>
<tr>
<td>Blogging facilitated information sharing</td>
<td>3.31 (0.48)</td>
<td>3.00</td>
<td>3.00 (0.58)</td>
</tr>
<tr>
<td>Blogging facilitated knowledge sharing</td>
<td>2.92 (0.49)</td>
<td>3.00</td>
<td>2.81 (0.38)</td>
</tr>
<tr>
<td>Satisfied with blogging system</td>
<td>3.08 (0.76)</td>
<td>3.00</td>
<td>2.85 (0.38)</td>
</tr>
<tr>
<td>Suggest adopting blogging for next year</td>
<td>3.12 (0.42)</td>
<td>3.00</td>
<td>2.96 (0.14)</td>
</tr>
</tbody>
</table>

*statistically significant at p < 0.05.
Table 8 Comparing frequent and infrequent users’ ratings for blogging’s effectiveness among BScN students.

<table>
<thead>
<tr>
<th>BScN students survey questions</th>
<th>Frequent users (n = 7)</th>
<th>Infrequent users (n = 7)</th>
<th>Sig. Mann–Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Median</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>- Reading others’ blogs is useful</td>
<td>3.14 (0.38)</td>
<td>3.00</td>
<td>3.14 (0.38)</td>
</tr>
<tr>
<td>- Blogging is suitable for learning from others’ internship experience</td>
<td>3.00 (0.58)</td>
<td>3.00</td>
<td>2.64 (0.48)</td>
</tr>
<tr>
<td>- Blogging facilitated information sharing</td>
<td>3.14 (0.38)</td>
<td>3.00</td>
<td>2.86 (0.69)</td>
</tr>
<tr>
<td>- Blogging facilitated knowledge sharing</td>
<td>2.71 (0.76)</td>
<td>3.00</td>
<td>2.86 (0.69)</td>
</tr>
<tr>
<td>- Satisfied with blogging system</td>
<td>3.00 (0.00)</td>
<td>3.00</td>
<td>2.71 (0.49)</td>
</tr>
<tr>
<td>- Suggest adopting blogging for next year</td>
<td>3.14 (0.69)</td>
<td>3.00</td>
<td>2.71 (0.76)</td>
</tr>
</tbody>
</table>

*statistically significant at p < 0.05.

4 Discussion

Evidence supporting the use of web technologies for education continues to grow, and in particular, blogging in education has been gaining support (Boulos et al., 2006; Grassley & Bartoletti, 2009). In this project, we implemented blogging in education, with a particular focus on learning during internship. To examine the use of blogging as a supportive tool during professional learning, we examined students’ frequency of use, perceptions of blogging, and learning processes and experiences when using blogs during internship. The design involved two groups of students from two professional disciplines, the aim being to determine whether blogging experiences would be similar or different in relation to different knowledge backgrounds and pedagogical designs. Our findings indicate that blogging worked well in the contexts of both disciplines, and highlighted the aspects of pedagogical design and contextual factors that may influence blogging.

4.1 What were the students’ patterns of participation in blogging?

The findings showed that both cohorts of students engaged in regular blogging regardless of whether the blogs contributed to their grades or not. Most students were involved in blogging at least once weekly, and students’ blogging activities were mostly centered on writing their own blogs. Writing comments also made up a substantial proportion of the blogs (see section 3.1). Reading others’ blogs, which has been identified as being one of the most effective aspects of blogging for students (Churchill, 2009), was also reported by the interns in this study to be a frequent blogging activity. Our findings indicate that blogging provided interns with a venue for some degree of collaborative learning, based on indicators that they regularly engaged in the two activities of blogging: reading and writing blogs. While reading blogs does not involve direct posting, it can be considered as an indicator of collaboration because this action may be useful in learning from others. The substantial number of comments in the interns’ blogs suggest that they were encouraged to write responses to what they had read, and possibly to engage in collaborative learning.

4.2 What were the students’ perceptions of using blogs during internship?

Students’ perceptions of the use of blogging during internship were found to be positive across cohorts and frequency groups in different dimensions. Students positively rated the use of blogging for information sharing, knowledge construction, problem solving and learning about others’ internship experiences. Their satisfaction was also apparent in their suggestion that blogging should be used for future interns. Open-ended comments further show the relevance of blogging for students’ learning experiences in terms of the cognitive and social aspects of professional learning. Comments further revealed the specific aspects of blogging that were perceived to be beneficial to learning and those that were found disadvantageous. One of the suggested benefits of blogging in education is that it facilitates the development of wider perspectives among students through peer interaction (Ellison & Wu, 2008), and this was apparent in the most common comment made by the students in this study.
that they were able to learn from others’ problem-solving experiences. Appreciation for the technical aspects of blogging was apparent in students’ positive views on multi-modal information sharing, which is consistent with earlier studies suggesting that the functional features of blogs support information and knowledge exchange (Du & Wagner, 2007). While blogging has been increasingly used in education, this current study provides another source of data indicating positive attitudes toward-blogging in the context of internship.

More BScN interns than BScIM interns reported that blogging facilitated learning from others’ problem-solving experiences. This might be partly because the internship tasks of BScN students were generally more similar regardless of the students’ placement. Hospital-based duties were expected to be consistent, while the tasks of the BScIM interns were more varied due to the differences in the nature of their placement organizations (e.g., library, bank, publishing company, police force). In effect, a BScIM intern’s problem-solving experiences may be less applicable in other settings.

A number of BScN students also reported that blogging was time consuming, but such a comment was not found among the BScIM students. This may be explained by the nature of the students’ work. While the student nurses were engaged in clinical work in hospitals, most of the BScIM students were engaged in work that required computer and internet use. Another contrast in comments between the groups is that two BScIM students noted that students wrote blogs just to complete the assignment, while two BScN students maintained that blogging was too dependent on a student’s own initiative. This may be related to the pedagogical nature of blogging in each discipline group.

4.3 What learning processes were the interns involved in when they engaged in blogging?

One of the key contributions of this study is the analysis of the learning processes of students when they are blogging. Blog content analysis in this study provided a way to illustrate the kind of learning processes that the students were involved in when they were engaged in blogging. Consistent with the literature (Churchill, 2009; Du & Wagner, 2007; Ladyshwesky & Garner, 2008), blogging was found to provide students with a platform for cognitive, metacognitive-reflective and affective aspects of learning. It has been suggested that blogging addresses the discursive nature of knowledge construction (Ferdig & Trammel, 2004). Furthermore, the feedback system of the blogging interface naturally affords students reflective opportunities. In this study, blogging served as an avenue for sharing information and constructing knowledge, reflecting on knowledge and experiences, providing social support, and communicating affective-emotive expressions. The two cohorts of students showed a high degree of engagement in cognitive and metacognitive processes as well as affective processes. Blogging may provide a way to bridge theory with experience in an internship learning environment, where metacognition and reflection are important processes. The affective processes also show how blogging may support students in communicating affect and emotions when they come across conflicts and complexity in real-world environments.

The frequency distribution of the blogs according to the overarching themes and subthemes appears to be consistent with the findings concerning students’ perceptions. While students perceived the blogs to be useful for information sharing, knowledge construction and problem solving, blog contents were also found to facilitate the social aspects of learning through collaborative information sharing, and cognitive aspects of learning through knowledge sharing and knowledge construction.

Although it has been suggested that blogging supports interaction among students and teachers (Yang, 2009), the social-collaborative aspect of learning seemed relatively less prominent in this study. These findings have implications for future pedagogical design of blogging. For instance, teachers may provide guidance into these other uses of blogging to extend students’ collaborative work. The social-collaborative aspect of learning may also be heightened by encouraging peer-to-peer feedback through pedagogical scaffolding, which will motivate students to interact with one another on the blogging platform.
4.4 Were there differences between student cohorts in terms of blogging behavior, perceptions, processes and experiences, and what other factors might have influenced blogging?

Frequency of blogging was not found to be associated with students' ratings for the perceived usefulness of blogging. Previous research has indicated that users who spend more time using a web-based tool in learning tend to be less positive in their satisfaction with the technology (Chu, 2008). Contrary evidence has also been found showing that the frequency of interaction in an online medium for education has no important role in students' satisfaction with the technology (Arbaugh, 2000). The findings of this current study show that bloggers generally had positive perceptions of the technology as a supportive tool for their learning, regardless of their frequency of use. This may be due to the relatively versatile functions offered by blogging (e.g., social interaction, information exchange), along with the accessibility that it offers.

Findings were compared between cohorts of different discipline backgrounds in order to gain some understanding of how blogging may work in higher education, particularly in professional learning. While quantitative ratings indicated that the professional discipline backgrounds of the students did not have a substantial effect on students' perceptions of the usefulness of blogging during internship, it appears that the pedagogical design is a relevant consideration in using blogs for education. For instance, the volume of blogs was found to be much higher among the BScIM cohorts, whose blogging was graded. Besides this, contradictory negative comments were also found between cohorts. In the context of the nursing internship, where blogs were not graded, students perceived that blogging was a limited learning experience due to its dependence on the students' initiatives. In contrast, the BScIM students, whose blogs were graded, felt that blogs were too formal, and students were only motivated to write in order to complete the assignment. Assessment for learning has been known to be a difficult area in higher education (Biggs, 1995), and these findings concerning blogging and other e-learning designs may shed light on and lead to further inquiry into these issues.

The findings indicate generally similar patterns in behavior, perceptions, and learning processes between the two cohorts, suggesting the usefulness of blogs for internship in different disciplines. Group comparisons between the cohorts of nursing and information management students showed how blogging was well-received in two distinct instructional contexts. While there were no significant technical concerns regarding the blogging platforms, further analyses suggested areas that might indicate the roles of pedagogical design in influencing blogging.

First, there were significant differences in the amount of blog entries between the two cohorts, which appear to be related to the nature of internship tasks and assessment design. The nature of the BScIM interns' tasks may have resulted in a significantly higher number of blogs among interns in this discipline relative to that of the nursing interns (see section 3.1). In terms of assessment, fundamental differences were present in the pedagogical design of the cohorts' internship programs. The BScIM students were asked to post their internship reflections as blogs, and this constituted a pre-determined percentage of their final grade. In contrast, while the nursing students were encouraged to post blogs throughout their internship, these blogs had no bearing on their grades. Consequently, a relatively higher volume of blogs among information management interns was found. Another factor that may explain the difference in the number of blogs between the two cohorts was the nature of the students' tasks during the internship. It was observed in an earlier study that blogging generated a stronger interest in disciplines that focused on tasks that involved information retrieval and search (Williams & Jacobs, 2004). In this study, the nursing students were engaged in clinical tasks in the hospital, whereas the BScIM students spent a large amount of time working with computers and online information sources. It has been noted in previous studies that the way in which students understand and use blogging is naturally associated with the tasks that are expected in their professional field (Kerawalla et al., 2008), and this seemed to be reflected in the blogging behaviors of interns in this study.

Second, discipline background did not seem to affect the overall perceptions of interns of the
usefulness of blogging during internship. While positive perceptions were reported for most items, the two cohorts had different degrees of positive perceptions of the usefulness of blogging for problem solving (Table 3). Nursing students found blogging more useful for problem solving than did information management students. This finding suggests that the variability of tasks among information management interns appeared to have reduced the applicability of peers’ problem-solving experiences in other contexts because of their unique work assignments. This implies that to enhance the benefits associated with blogging in education, there is a need to support students in identifying commonalities and differences across internship experiences.

Responses to open-ended probes illustrated how the nursing students emphasized more the personal and affective domains, while the information management students focused more on the cognitive domains of learning. This distinction was also apparent in the findings from the blog contents. The most dominant learning dimension found in the BScIM interns’ blogs was cognitive, while most of the BScN interns’ blogs were coded as metacognitive-reflective. Furthermore, the reflective blogs of nursing interns were more focused on personal reflections. These differences might be attributed to the fundamental differences between the professional disciplines – information management versus health care.

Differences in mentoring and support were also present in this study, in that the nursing students had more frequent direct contact supervision, whereas the information management students primarily worked on their own. An optimal amount of facilitatory support may be helpful, but too much guidance may also be detrimental to independent learning. The role of facilitators in influencing blogging use appears to be important and needs to be investigated further.

5 Conclusion

While studies on blogging in education have generally examined students’ perceptions and blogging activities (Farmer, Yue, & Brooks, 2008; Lu, Lin, Hsiao, & Cheng, 2010), few have undertaken detailed qualitative analyses of blogging content to examine the learning processes involved in blogging. One of the contributions of this study is the development of a coding scheme that specifically focuses on students’ experiences during internship, thereby extending the understanding of blogging processes in education. This may serve future investigations into how blogging experiences in an educational context can be scaffolded.

In recent years, the increasing number of bloggers has been accompanied by a growing body of research that has explored the impact and use of blogs among different user groups (Schmidt, 2008). This research builds on the understanding and development of the blogging phenomenon during internship – a phase in education where students are expected to make sense out of real experiences and integrate them for future use (Clarke, 2004). By examining the use of blogging across cohorts of students, findings of our study contribute to the base of evidence for the effectiveness of blogging in higher education. We have illustrated the usability of the technology such that the interns in this study were found to engage in regular blogging, regardless of whether it was graded or not. Students’ perceptions of blogging during internship were found to be generally positive, implying that blogging may indeed be a suitable learning platform that interns could engage in during their professional learning. The usefulness of blogs was also manifested by the learning processes that were revealed by the blog contents.

Essentially, by exploring how blogging may serve to support learning in internship, our findings offer empirical evidence that lends support to the role of blogging in teaching and learning. As such, this study may also serve as an impetus for further investigations that might apply blogging in diverse educational settings.

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